

REMARKS

Claim 1 is amended. Claims 1-8 remain in the case.

The drawings were objected to as failing to comply with 37 CFR 1.84(b)(4) because the reference character "7" and character "5" had been designated for more than one feature. Further the drawings were objected to under 37 CFR 1.83 (a) because the Examiner states that the drawings failed to show reference number "8" and "9" as described in the specification.

The specification has been amended to correct the reference number in the specification to correspond with the drawings. The objection of the drawings should be overcome by the Amendment to the Specification in paragraph [0018] and [0019].

Claims 1-8 were rejected under 35 USC 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In particular, the Examiner objected to the terms "top land" as being unclear and the term "the sides" lacking antecedent basis. "Top land" is a term of art known in the industry for defining the vertical space of a piston that separates the combustion area and the top groove. The term "top land" is illustrated and discussed in the attached website articles. The term "the side" has been amended to read "a side". The Amendment and explanation for the terms in claim 1 should overcome the rejection under 35 USC 112, second paragraph, and reduce the issues for appeal.

Claims 1 and 6-8 were rejected under 35 USC 103(a) as being unpatentable over German Patent Number DE 1210302 in view of Berchem (United States Patent Number 4,662,047). The objection of the claims 1 and 6-8 are traversed. German Patent '302 does not show the step of introducing a recess behind the at least one shoulder. Further, German Patent '302 does not show or disclose reshaping the shoulder so that the recess is closed by the shoulder. German Patent '302 merely shows inner and outer shaft portions D and E that are joined together along their length leaving an upper portion 8 to form a channel. Berchem does not show or disclose reshaping the shoulder 7 so that the recess is closed by the shoulder. The shoulder 7 in Berchem only provides an annular gap 6. The annular gap 6 is never closed by the shoulder itself.

Therefore, since neither German Patent '302 nor Berchem show or disclose a shoulder reshaped by deformation for closing a recess, claims 1 and 6-8 are believed to be allowable. Further, since German Patent '302 shows a gap between inner and outer shafts D and E, it would require substantial reconstruction or design of the piston shaft in German Patent '302 to employ at least one circumferential shoulder projecting laterally from the piston as taught by Berchem. Also, there would be no purpose to add a shoulder projection as taught by Berchem to the piston disclosed in German Patent '302. Further if one could combine the circumferential shoulder 7 in Berchem to the piston in German Patent '302 one would still not have the claimed invention. Therefore, since neither of the cited art of German Patent '302 in Berchem show nor disclose the step of reshaping the shoulder so that the recess is closed by the shoulder, claims 1 and 6-8 are believed to be allowable.

Regarding the examiner's arguments for claim 6, since German Patent '302 does not have a shoulder, then German Patent '302 cannot teach at least one shoulder rigidly connected to a piston blank or to another shoulder forming a contact area.

Regarding the examiner's arguments for claim 8, the seal (f) in German Patent '302 is not located on a shoulder as required by the present invention. The seal (f) is along the vertical inner wall (d) of the piston. Berchem does not show or disclose a seal. Therefore, the combination of German Patent '302 and Berchem does not render the invention of claim 8 obvious.

Claims 2-5 were rejected under 35 USC 103(a) as being unpatentable over German Patent '302 and Berchem as applied to claim 1 and further in view of the Mechanical Engineer's Handbook. In view of the allowance of claim 1, it is also believed that dependent claims 2-5 are also allowable.

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In addition, inasmuch as claim 1 is believed allowable, dependent claim 2-7 are believed to be allowable also.

This amendment should place this case in condition for passing to issue. Such action is requested. If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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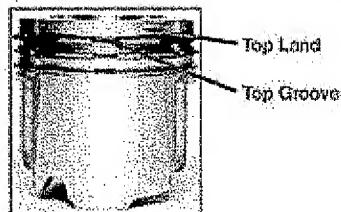
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Piston Anatomy

Top Land The vertical space of the piston that separates the combustion area and the top groove.



Top Groove The Top Groove houses the compression ring. At the time of combustion, exhaust gases move behind the ring and push it out creating a tight seal for optimal compression.

Undercrown The under-side area of the piston where engine oil is sprayed to keep the piston from over-heating.

Piston Deposits Equals Inferior Performance**Top Land**

- Impede the gas flow to the compression ring
- Increase cylinder wear/bore polishing
- Decrease engine efficiency and engine life

Top Groove Deposits

- Cause rings to stick
- Cause exhaust gases to blow by the compression ring
 - ▶ Increasing *acidity* in the oil
 - ▶ Increasing *soot* in the oil
 - ▶ Increasing the temperature and *oxidation* rate of the oil
 - ▶ Increasing oil consumption
- Decrease engine compression efficiency and engine oil



Acceptable



Unacceptable

**Undercrown Deposits**

- Impede the heat transfer function of the oil
- Cause the engine to run hotter
- Decrease engine efficiency and engine oil

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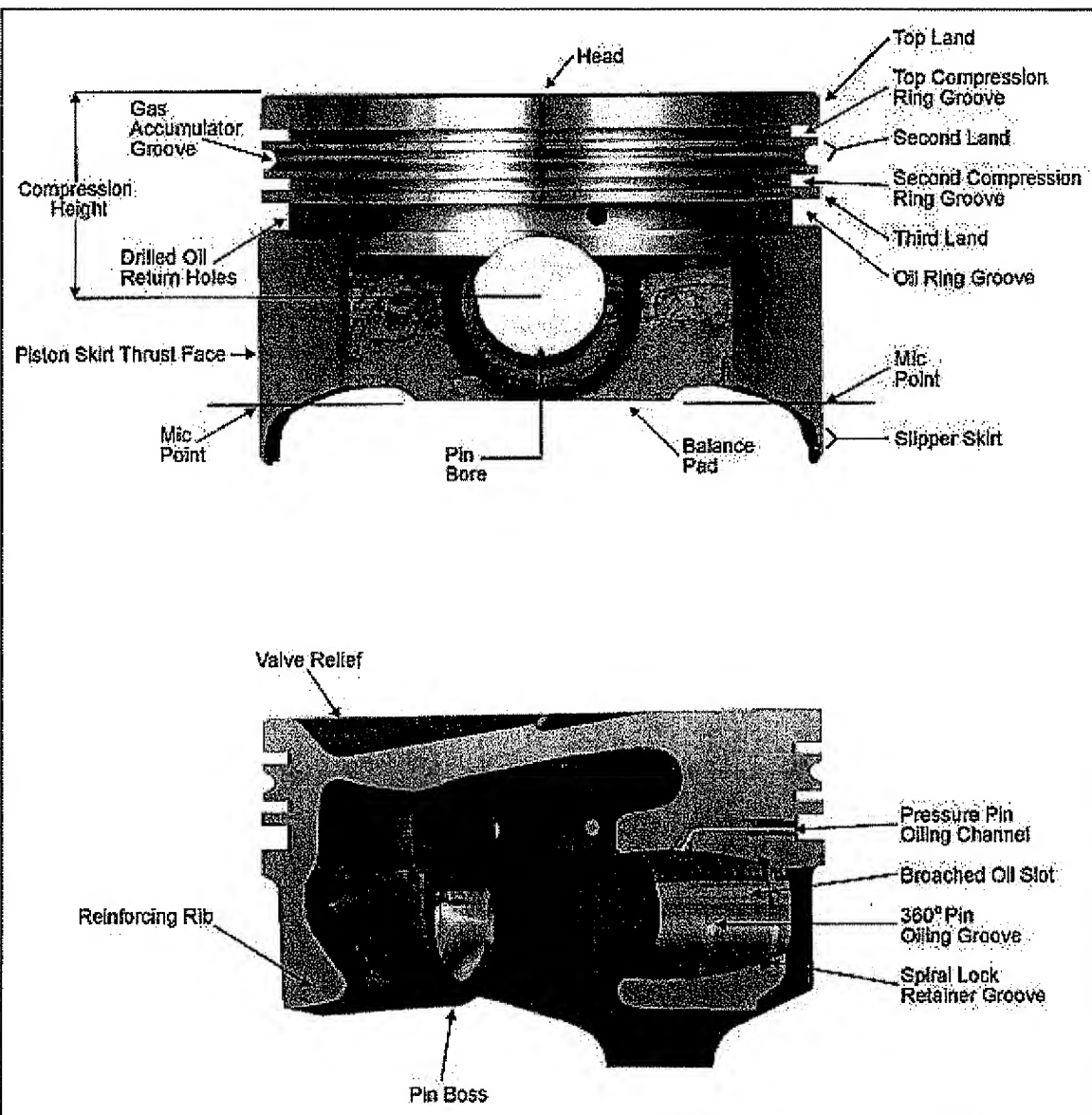
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Platinum

Piston Terminology



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GROOVE

FINAL COMPRESSION
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